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ABSTRACT

The General Accounting Office (GAO) examined private-sector workforce training practices for information technology (IT) and non-IT professionals. Data were collected from the following sources: a literature review; discussions with academic and professional authorities; interviews with executives and managers at leading companies regarding their IT training management practices and activities; and a panel discussion. The study identified 22 existing and emerging practices in the following areas that leading companies are using to implement effective IT training. The management processes and selected practices identified were as follows: (1) align IT with business goals (enlist executive-level champions, involve critical stakeholders); (2) identify and assess IT training needs (document competencies/skills required for each job description; perform gap analyses to determine needed training); (3) allocate IT training resources (use an investment process to select and manage training projects; provide resources for management training); (4) design and deliver IT training (give trainees choices among different training delivery methods, build courses using reusable components); and (5) evaluate and demonstrate the value of IT training (collect information on how job performance is affected by training, assess evaluation results in terms of business impact). (An appendix constituting more than 90% of this document contains a detailed report on the GAO study's objectives, scope, methodology, and findings.) (MN)

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United States General Accounting Office

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Report to Congressional Requesters

January 2003

INFORMATION TECHNOLOGY TRAINING

Practices of Leading Private-Sector Companies

ED 475 700

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Highlights

Highlights of GAO-03-390, a report to the Chairman, Tom Davis, Committee on Government Reform and Representative Jim Turner, House of Representatives

INFORMATION TECHNOLOGY TRAINING

Practices of Leading Private-Sector Companies

Why GAO Did This Study

The rapid pace of technological change, with its potential to transform the way the government delivers services, makes information technology (IT) human capital a critical issue for federal agencies.

GAO has identified strategic human capital management as a high risk area for the federal government, and the demand for skilled IT workers is expected to increase over the long term. Given that competition for workers affects the federal government as it does any other employer, effective training of staff is essential to developing and retaining a qualified workforce.

Some private-sector companies are recognized for their effective and innovative training programs for the IT workforce, which could provide models and examples for federal agencies. To help federal agencies better design and implement such training programs, GAO was asked to examine private-sector practices for training both IT and non-IT professionals (e.g., business managers and other staff needing training in IT) that could be used as a basis for addressing federal efforts.

What GAO Found

GAO identified 22 existing and emerging training practices used by leading companies to implement effective IT training. We organized these practices and accompanying case studies under five training management processes that we defined based on input from industry experts, published research, and previous GAO work (see table below). Although none of the companies was performing all the practices, the majority performed 10 or more.

Organizations and experts agree that these practices could result in more effective training management, but in applying the identified practices, we noted several critical issues (e.g., funding constraints and demonstrating return on investment) that should be considered. The practices may also suggest approaches to IT training for government agencies to consider.

GAO's discussions with leading private sector companies indicate that training is not simply a support function, but a strategic element in achieving corporate objectives. Further, although companies are adopting new ideas about training, many initiatives are in their early stages, and private sector officials expressed interest in learning about innovative practices emerging from the public sector.

IT Training Management Processes and Sample Practices (see app. I for full list)

Management processes	Sample practices
Align IT training with business goals	Enlist executive-level champions
	Involve critical stakeholders
Identify and assess IT training needs	Document competencies/skills required for each job description
	Perform a gap analysis to determine needed training
Allocate IT training resources	Use an investment process to select and manage training projects
	Provide resources for management training, e.g., leadership and project management
Design and deliver IT training	Give trainees choices among different training delivery methods
	Build courses using reusable components
Evaluate/demonstrate the value of IT training	Collect information on how job performance is affected by training
	Assess evaluation results in terms of business impact

Source: GAO.
Note: Analysis of company-provided information.

www.gao.gov/cgi-bin/getrpt?GAO-03-390.

To view the full report, including the scope and methodology, click on the link above. For more information, contact Joel Willemssen at (202) 512-6253 or willemssenj@gao.gov.

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United States General Accounting Office
Washington, D.C. 20548

January 31, 2003

The Honorable Tom Davis
Chairman
Committee on Government Reform
House of Representatives

The Honorable Jim Turner
House of Representatives

The rapid pace of technological change, with its potential to transform the way the government delivers services, makes information technology (IT) human capital a critical issue for federal agencies. We have identified strategic human capital management as a high risk area. In the long term, demand for highly skilled IT workers is expected to increase. According to a 2002 study of private-sector employers by the Information Technology Association of America (ITAA), the demand for these highly skilled IT workers exceeds supply.[1] Given that this reported shortage affects the federal government as it does any other employer, effective training of staff is essential to developing and retaining a qualified workforce.

Our objective was to examine private-sector workforce training practices for both IT and non-IT professionals (e.g., business managers and other staff needing training in IT). To achieve this objective, we reviewed existing research, held discussions with academic and professional authorities, and interviewed executives and managers at leading companies about their IT training management practices and activities. We also collaborated with the National Academy of Science to host a panel discussion with academic authorities. The experts on this panel discussed overall training issues, provided input on training management processes, and identified other effective training practices. We used this information, as well as the extensive research and trade literature available on IT training practices, to develop a view of what leading private-sector organizations are doing in the IT training area.

On October 18, 2002, we provided briefing slides on the results of our study to you in your capacities as Chairman and Ranking Minority Member of the Subcommittee on Technology and Procurement Policy. These results, along

[1]Information Technology Association of America, *Bouncing Back: Jobs, Skills, and the Continuing Demand for IT Workers* (May 2002).

with additional information and new and expanded case studies, are included as an appendix to this letter. The purpose of this letter is to officially transmit the information in published form to you as Chairman and Member of the Committee on Government Reform.

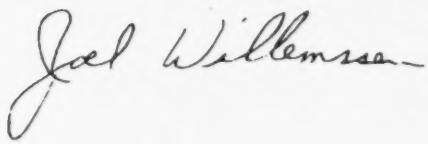
In brief, we found 22 existing and emerging practices that are used by leading companies to implement effective IT training. The majority of the companies performed 10 or more of the identified practices, but none was performing all. The practices and case studies provided in the appendix suggest approaches to IT training that government agencies could consider.

In addition, we noted several critical issues (e.g., funding constraints and demonstrating return on investment) that should be considered in implementing these practices. GAO's review of private-sector practices indicates that training is not simply a support function, but a strategic element in achieving corporate objectives. Further, although companies are adopting new ideas about training, many initiatives are in their early stages, and private-sector officials expressed interest in learning about innovative practices emerging from the public sector.

Many organizations contributed to our study. American Telephone & Telegraph (AT&T), Cable & Wireless, Cisco, Delta Technology, Fannie Mae, FleetBoston, International Business Machines (IBM), International Truck and Engine, Raytheon, Science Applications International Corporation (SAIC), and United Services Automobile Association (USAA) all met with us to discuss their training programs. The federal Chief Information Officers (CIO) Council, the Information Technology Association of America (ITAA), the Private Sector Council, and the American Society for Training & Development (ASTD), as well as IT consulting firms Gartner and Giga, also provided assistance and information.

Unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to interested congressional committees. In addition, copies will be made available to others upon request. Copies of this report are also available at no charge on GAO's Web site at www.gao.gov.

If you or your offices should have any questions concerning this report, please contact me at (202) 512-6253 or Megen Davis, Assistant Director, at (202) 512-6398. We can also be reached by E-mail at willemssenj@gao.gov and davism@gao.gov, respectively. Key contributors to this report were Barbara Collier, Vijay D'Souza, John Ortiz, Tomás Ramirez, Jr., and Glenn Spiegel.



Joel Willemssen
Managing Director, Information Technology

Information Technology Training

Information Technology Training: Practices of Leading Private-Sector Companies

Committee on Government Reform
House of Representatives

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- Evaluating/demonstrating the value of IT training

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Introduction and Objective

GAO has identified strategic human capital management as a high risk area for the federal government. According to a study of private-sector employers by the Information Technology Association of America (ITAA), the demand for skilled IT workers exceeds supply, and the shortage is expected to continue.[1] Given that the shortage affects the federal government as it does any other employer, effective training of existing staff is essential to developing and retaining a qualified workforce.

Some private-sector companies are recognized for their effective and innovative training programs, which could provide models and examples for federal agencies. To help federal agencies better design and implement IT workforce training programs, you asked us to examine private-sector training practices both for IT professionals and for other staff needing IT training (e.g., business managers) that could be used as a basis for addressing federal efforts.

[1] Information Technology Association of America, *Bouncing Back: Jobs, Skills and the Continuing Demand for IT Workers* (May 2002).

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Scope and Methodology

We selected companies considered leaders in IT training by professional organizations, publications, and academic experts. We based our selection on awards, significant accolades, and expert recommendations. Specifically:

- We searched published sources and the Internet for companies recognized as leaders by trade associations and industry publications. Examples include *Computerworld* and *Training* magazine rankings.
- We solicited recommendations from industry and academic experts.
- To identify and establish contacts with candidate companies, we consulted with
  - the federal Chief Information Officers (CIO) Council;
  - professional associations (the Information Technology Association of America, the Private Sector Council, and the American Society for Training & Development); and
  - IT consulting firms (Gartner and Giga).

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Scope and Methodology

On the basis of our discussions and analyses, we conducted site visits at 11 companies identified as leaders in IT training:

- American Telephone & Telegraph (AT&T)—Telecom
- Cable & Wireless—Telecom
- Cisco—Technology
- Delta Technology—Airline
- Fannie Mae—Finance
- FleetBoston—Finance
- International Business Machines (IBM)—Technology
- International Truck and Engine—Manufacturing
- Raytheon—Defense & Electronics
- Science Applications International Corporation (SAIC)—Research & Engineering
- United Services Automobile Association (USAA)—Finance & Insurance

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Scope and Methodology

At the companies visited, we reviewed training program documentation and interviewed executives, business unit managers, training managers, and training recipients about their programs.

Specifically, we provided a standard set of questions to each company to obtain information on the organizational placement, structure, and management of training. We also obtained additional documentation on specific training initiatives.

We analyzed the data to identify existing and emerging training practices. The majority of the companies performed 10 or more of the identified practices, although none was performing all. However, organizations and experts agreed that all the practices could result in more effective training management. The companies also reviewed and commented on a draft list of the practices. These practices may suggest improvements in public sector training programs.

We also analyzed the data to develop specific case studies that exemplified one or more of the practices. At the conclusion of our research, all companies reviewed and verified the accuracy of our descriptions of their training initiatives. We did not, however, verify the accuracy of claims made by the companies.

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Scope and Methodology

To organize our work, we grouped the practices and case studies into five categories (training management processes) that we identified based on input from industry experts, published research, and our previous work. The categories are (1) aligning IT training with business goals, (2) identifying and assessing IT training needs, (3) allocating IT training resources, (4) designing and delivering IT training, and (5) evaluating/demonstrating the value of IT training.

To validate our methodology, we consulted internal and external experts on workforce development and training issues.

Also, as part of the consultative process, we collaborated with the National Academies of Science to host a 1-day panel discussion with academic authorities. The panel experts discussed overall training issues, validated our management processes, and identified effective training practices. The panel's insights provided a broader perspective than companies alone could provide.

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Scope and Methodology

Further, we facilitated on-line discussions of preliminary results with academic, private-sector, and cognizant GAO staff to solicit comments and feedback on key issues.

We conducted our review from November 2001 to November 2002, in accordance with generally accepted government auditing standards.

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Background

- Training is a vital part of the human capital equation. An organization's approaches to human capital development and training should be aligned to support its mission, vision, goals and objectives, and strategies.
- According to a study by the National Association of Public Administration,[2] there is a lack of investment in continuous learning within the federal government. The study further stated that this lack of investment is especially problematic in the dynamic and rapidly changing world of IT.
- As companies are forced to develop and implement effective IT training programs with fewer resources, they are exploring innovative approaches to training using both existing and emerging practices.
- The following practices, grouped into management processes, may help federal agencies improve their IT training programs.

[2] National Academy of Public Administration, *The Transforming Power of Information Technology* (August 2001).

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Private-Sector Practices

Align IT training with business goals	• Enlist executive-level champions (sponsorship) to ensure that training strategies are incorporated into corporate decisionmaking and aligned with business goals • Involve critical stakeholders, such as top management, business unit managers, subject matter experts, human capital staff, and end users, in planning IT training • Address future skill needs and new technologies as part of the planning process
Identify and assess IT training needs	• Identify and document competencies/skills required for each job description • Maintain a current inventory of skills • Address overall career development issues as well as skill-specific training issues • Perform a gap analysis to determine where training is needed • Use self-directed tools, such as individual development plans, to give employees responsibility in assessing their development needs • Use a single portal to give staff and managers access to training and career development information
Allocate IT training resources	• Ensure that an investment process is in place to select and manage training projects • Consider the benefits and costs associated with various training design and delivery methods—e.g., Internet-based as opposed to classroom training • Identify people who have high potential and provide them specialized training opportunities • Ensure that resources are allocated for management training—e.g., leadership and project management
Design and deliver IT training	• Provide IT trainees with the flexibility to choose among different IT training delivery methods • Ensure that on-the-job training is planned and monitored as part of the training process • Consider combining different teaching methods (for example, Web-based and instructor-led) within the same course • Provide just-in-time training • Consider outsourcing training solutions—e.g., university partnerships and external IT training and content providers • Build courses using reusable components
Evaluate/demonstrate the value of IT training	• Collect information on how job performance is affected by training • Validate IT content learning by testing and certification of specific skills—e.g., Java or C++ • Assess evaluation results in terms of business impact

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Aligning IT Training with Business Goals

By linking IT training programs to their overall business strategy/goals, companies can promote staff development that can best achieve corporate objectives.

While the majority of the companies we visited are performing one or more of the key practices associated with aligning IT training to the overall goals of the company, only two have developed comprehensive planning processes to achieve this alignment.

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Aligning IT Training with Goals

Practices

- Enlist executive-level champions (sponsorship) to ensure that training strategies are incorporated into corporate decisionmaking and aligned with business goals
- Involve critical stakeholders, such as top management, business unit managers, subject matter experts, human capital staff, and end users, in planning IT training
- Address future skill needs and new technologies as part of the planning process

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Aligning IT Training with Goals

Case Study 1

A process was established to link learning strategy to overall business direction.

Practice Illustrated

- Involve critical stakeholders

Background

Between 2001 and 2002, this large telecom company reorganized its training program. The company believed it could no longer meet "new world challenges using the old world model." It did not have a process linking a well-planned and defined training program to corporate business strategies.

Challenge

To create a process that links training to an overall business strategy to achieve business objectives.

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Aligning IT Training with Goals

Case Study 1

Solution

According to a senior training official, the company established the "Governance Process Flow" model, which is intended to involve all levels of the company in developing a training strategy linked to the business strategy. To ensure that all stakeholders are included, corporate strategic information is communicated throughout the company. The stakeholders include the following:

- Learning Board (senior executives and one training organization representative)
- Learning Council (executives and two training organization representatives)
- Learning Services (training organization)
- Business Lines (executives, managers, and directors)

Reported Results

Training is better linked to the overall business strategy.

Major business units and the training unit are now working together more effectively because they understand how each unit is making a contribution to achieving business goals.

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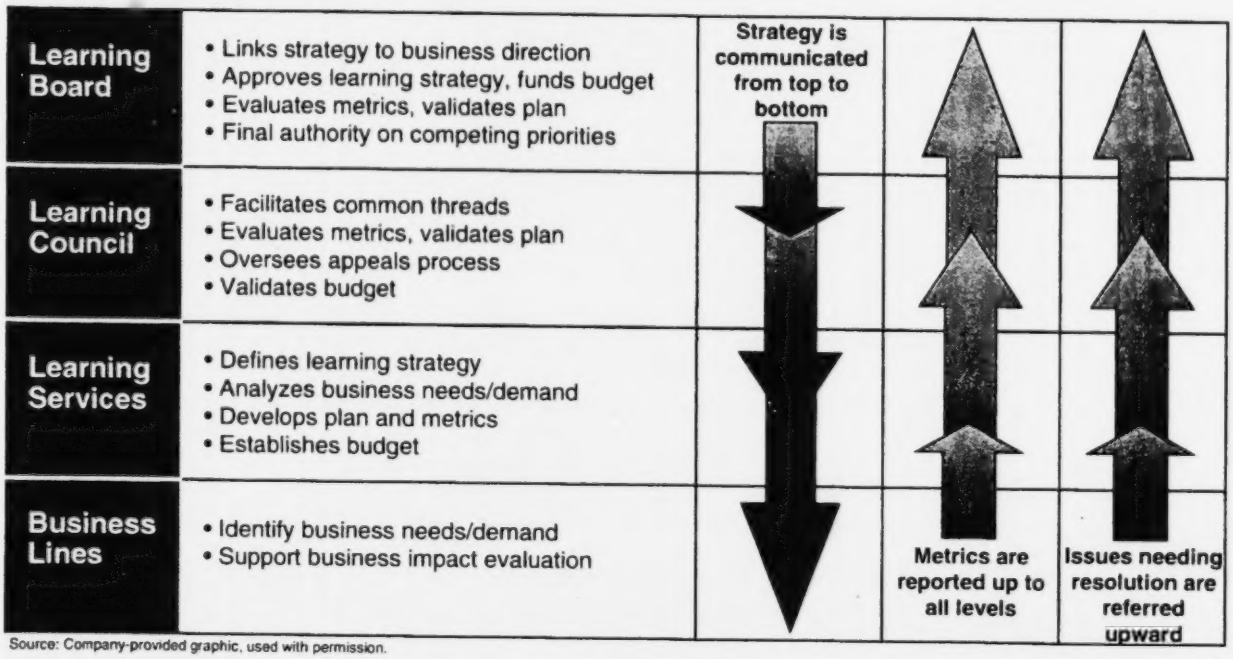
Aligning IT Training with Goals

Case Study 1

Governance Process Flow Model


Learning Board
• Links strategy to business direction
• Approves learning strategy, funds budget
• Evaluates metrics, validates plan
• Final authority on competing priorities
Learning Council
• Facilitates common threads
• Evaluates metrics, validates plan
• Oversees appeals process
• Validates budget
Learning Services
• Defines learning strategy
• Analyzes business needs/demand
• Develops plan and metrics
• Establishes budget
Business Lines
• Identify business needs/demand
• Support business impact evaluation
Strategy is communicated from top to bottom
Metrics are reported up to all levels
Issues needing resolution are referred upward

Source: Company-provided graphic, used with permission.

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Aligning IT Training with Goals
Case Study 2

Strategic Learning Plan process helps align learning programs with business priorities.

Practices Illustrated
- Enlist executive-level champions
- Involve critical stakeholders
- Address future skill needs and new technologies as part of the planning process

Background

As a multinational corporation with a complex organizational structure, this technology company needed to create more cohesion between learning strategies and the strategic planning process.

Challenge

To develop a corporate learning approach that aligns learning priorities with business priorities.

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Aligning IT Training with Goals

Case Study 2

Solution

The company established a process that develops a strategic learning plan that aligns learning programs with business priorities. The process begins with determining business priorities, and then identifying skill needs, potential learning interventions to address gaps, and predicted business results. Part of this process, the strategic learning framework, includes validating plans against strategic business priorities. Top management is involved at key points to ensure alignment with strategic direction.

Reported Result

The process enables the company to develop and implement training that is linked to its strategic business objectives and delivers measurable results.

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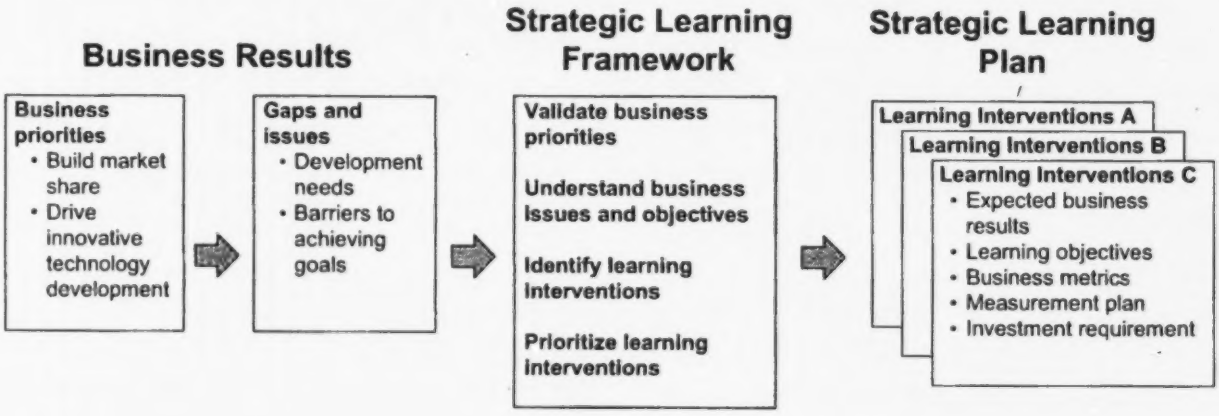
Aligning IT Training with Goals

Case Study 2

Strategic Learning Plan Process



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Aligning IT Training with Goals

Case Study 2

Detailed Steps in Strategic Learning Framework

	Step 1 Validate Business Priorities	Step 2 Understand Business Issues and Objectives	Step 3 Identify Learning Interventions	Step 4 Prioritize Learning Interventions
Activities	• Review business plans • Identify critical priorities and cause and effect links • Identify key measures ◇ Validate with unit/ organization leadership	• Identify specific business issues and objectives • Select critical issues to be addressed by learning • Perform gap analysis	• Brainstorm learning intervention alternatives • Select high potential interventions	• Review list of proposed interventions • Apply prioritized process ◇ Validate with business unit leadership
Deliverables	• Strategy map highlighting business priorities • Selected business measures	• Critical business issues • Gaps potentially to be addressed by learning	• Learning interventions	• Finalized strategic learning plan • Measurement plan
Roles	• Corporate Learning ● Executive Sponsor • Learning Contact • Subject Matter Experts	• Corporate Learning • Learning Contact • Subject Matter Experts	• Corporate Learning • Learning Contact • Subject Matter Experts	• Corporate Learning ● Executive Sponsor • Subject Matter Experts

..... Critical stakeholders involved at all stages

● Involvement by executive sponsor in steps 1 and 4 helps ensure alignment with strategic goals

◇ Plans are validated and revalidated against strategic objectives

Source: Company-provided graphic, used with permission.

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Identifying and Assessing IT Training Needs

A company's skill needs may change because of new initiatives, new technology, market forces, workforce attrition, or mergers and acquisitions, creating a need for training. Companies should assess employees' competencies and identify gaps between skills that employees need and those they have. Gathering information from various levels of the company allows managers to better assess training needs. In addition, industry experts and practitioners are beginning to recognize that IT training should focus on broader career development needs as well as skill-specific training needs.

We found that, rather than simply fulfilling training requests, nearly all (10) of the companies are performing practices to more effectively identify and assess training needs. Companies are also beginning to address long-term career development issues.

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Identifying and Assessing Needs

Practices

- Identify and document the competencies/skills required for each job description
- Maintain a current inventory of skills
- Address overall career development issues as well as skill-specific training issues
- Perform a gap analysis to determine where training is needed
- Use self-directed tools, such as individual development plans, to give employees responsibility in assessing their development needs
- Use a single portal [3] to give staff and managers access to training and career development information

[3] A site featuring a suite of commonly used services, serving as a starting point and frequent gateway to the Web (Web portal).

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Identifying and Assessing Needs
Case Study 3

Senior management input, "technology councils," and individual development plans are used to identify and assess workforce needs.

Practices Illustrated
- Identify and document skills
- Use self-directed tools

Background

This multinational technology leader with a technically diverse workforce places a high value on learning. The company has engineering and information technology professionals in manufacturing and service positions worldwide with a very diverse set of knowledge requirements.

Challenge

To identify the training that satisfies the needs of this technically diverse and geographically dispersed workforce and prioritize the courses in greatest demand.

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Identifying and Assessing Needs

Case Study 3

Solution

The company's training organization uses the following resources to effectively identify and assess training gaps and needs (also see slide on next page):

- **Senior management** identifies corporatewide topics such as quality management that require training support.
- **"Technology councils"** representing technical disciplines throughout the company identify and assess training curricula for different IT and engineering jobs.
- **Individual development plans** (IDPs) are self-directed tools completed by each employee and supervisor to identify needed training. The IDP information is compiled by the training organization through the use of a learning management system to identify, prioritize, and schedule training companywide.

Reported Results

The company's ability to identify and prioritize training needs is enhanced because it is based on input from management, subject-matter experts, and individuals.

Skills needed for each job position are more comprehensively defined based on input from technical experts through the organization.

Individual development plans allow employees to better identify and manage their own training needs and establish commitment from both employees and managers to fulfill those needs.

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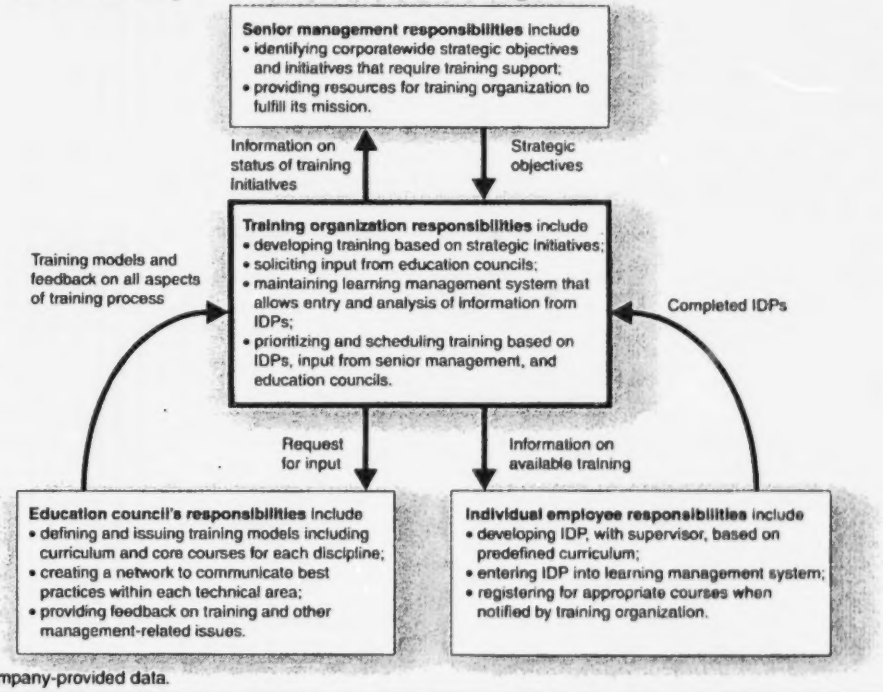
Identifying and Assessing Needs

Case Study 3

Sources Used to Identify and Assess IT Training Needs


Senior management responsibilities include
• identifying corporatewide strategic objectives and initiatives that require training support;
• providing resources for training organization to fulfill its mission.
Information on status of training initiatives
Strategic objectives
Training organization responsibilities include
• developing training based on strategic initiatives;
• soliciting input from education councils;
• maintaining learning management system that allows entry and analysis of information from IDPs;
• prioritizing and scheduling training based on IDPs, input from senior management, and education councils.
Training models and feedback on all aspects of training process
Completed IDPs
Request for input
Information on available training
Education council's responsibilities include
• defining and issuing training models including curriculum and core courses for each discipline;
• creating a network to communicate best practices within each technical area;
• providing feedback on training and other management-related issues.
Individual employee responsibilities include
• developing IDP, with supervisor, based on predefined curriculum;
• entering IDP into learning management system;
• registering for appropriate courses when notified by training organization.

Source: GAO.
Note: Analysis of company-provided data.

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Identifying and Assessing Needs

Case Study 4

IT learning tracks help employees assess their development needs.

Practices Illustrated

- Identify and document skills
- Use self-directed tools
- Use a single portal

Background

This technology company is using the Internet to transform how it conducts business. The company has thousands of technical specialists located all over the world, who need to stay technically and professionally current on whole categories of technology and new Internet-based products and services.

Challenge

To provide readily accessible career and functional training information to a diverse and global technical workforce that can use this information to identify and assess their technical training and development needs.

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Identifying and Assessing Needs

Case Study 4

Solution

To establish IT learning tracks, the company took the following steps:

- Developed a Web-based single point of entry system that allows employees located worldwide to access technical training and career development information.
- Established an advisory council that defined the required skills for each technical position. The council is made up of subject matter experts and representatives from the technical management and training groups.
- Created curricula on line for specific technical positions. The slide on the next page is an example of a screen from the company's training portal. It shows the curriculum for IT Engineer–Java. Each curriculum is divided into core courses, elective courses, and informal learning sources.
- Designed comprehensive guidance to help employees manage their career paths and enhance their professional development.

Reported Results

Workers' ready access to development information allows them to control their own development and career paths.

Employee loyalty is enhanced by the availability of opportunities for employees to direct their own learning pace and development.

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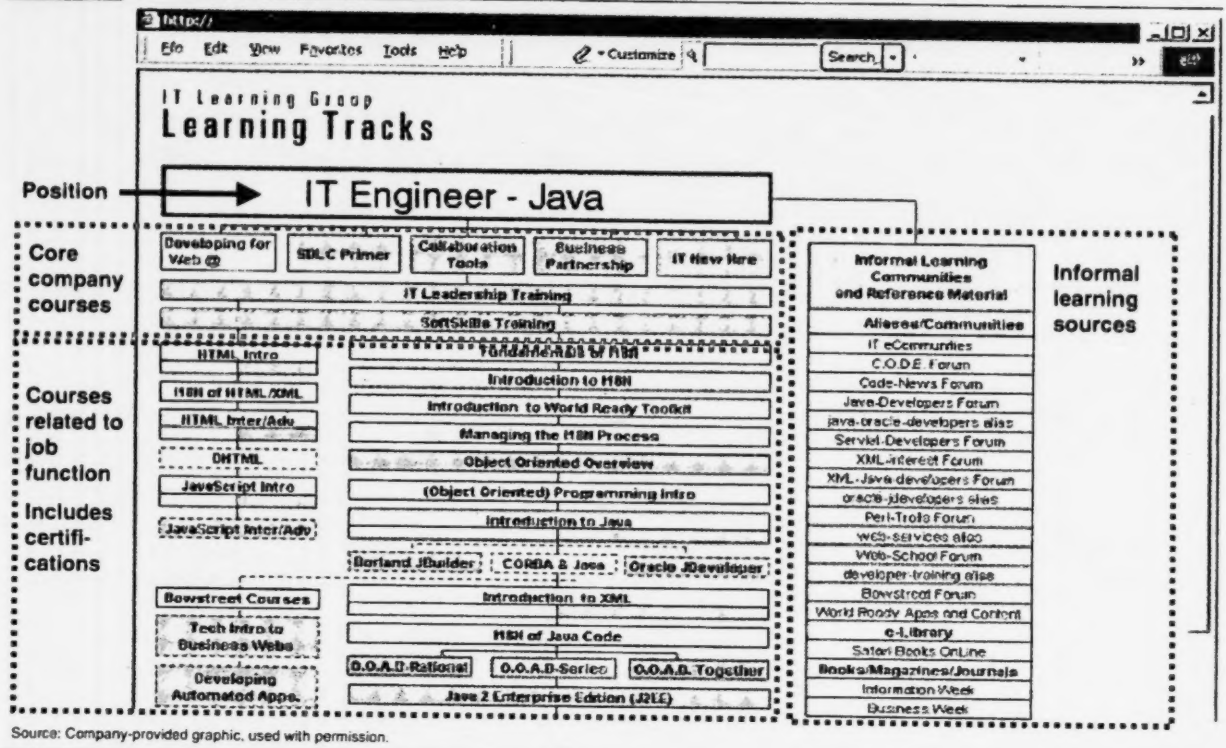
Identifying and Assessing Needs

Case Study 4



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Identifying and Assessing Needs

Case Study 5

IT Professional Program guides career development.

Practice Illustrated

- Address overall career development issues as well as skill-specific training issues

Background

The IT department of a manufacturing company found that it needed well-rounded IT staff with the skills that allowed them to be effective in the business environment, not just in technical areas.

Challenge

To develop balanced, well-rounded IT professionals rather than narrowly focused technicians.

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Identifying and Assessing Needs

Case Study 5

Solution

The company developed the "IT Professional Program," which creates a career ladder to a technical position at the senior executive level. The program is used to guide and evaluate the career development of IT professionals. Competencies are identified in six categories, only one of which is technical:

- Leadership (e.g., facilitation capabilities, persuasiveness, developing others)
- Innovation (e.g., strategic thinking, applying new skills)
- Effectiveness (e.g., teamwork, customer consciousness, prudent risk taking)
- Communications (e.g., written and personal communications, negotiation)
- Business processes (e.g., corporate-specific processes, IT division processes)
- Technical and business domain (e.g., job-specific technical skills)

Employees advance based on their proficiency in the competencies. Because the objective is to develop balanced, well-rounded staff proficient in nontechnical and technical skills, all six evaluation categories are weighted equally. Salary determination is based on the lowest-scoring category.

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Identifying and Assessing Needs

Case Study 5

Solution (cont'd)

The company provides formal training through a corporate university, on-line courses, and courses at local colleges, but it also uses on-the-job training since company staff believe that formal training provides only a small part of what an employee needs to know to perform effectively.

Reported Result

The IT Professional Program has helped develop well-rounded IT staff who understand the business and can work well with other staff and business units. Other benefits are improved retention and morale, because career ladder steps are well defined, employees understand what they need to do to get promoted, and there is a full career ladder up to a senior level.

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Allocating IT Training Resources

As in any other business area, training must compete for corporate resources. It is important that companies prioritize and manage resources to ensure that training projects are effectively identified and implemented.

The leading companies we visited use various approaches to deciding how to allocate training resources. Four of these companies are establishing structured investment processes to select and manage training projects. Four others target large amounts of training resources at a fairly small group of promising applicants.

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Allocating IT Training Resources

Practices

- Ensure that an investment process is in place to select and manage training projects
- Consider the benefits and costs associated with various training design and delivery methods—e.g., Internet-based as opposed to classroom training
- Identify people who have high potential and provide them specialized training opportunities
- Ensure that resources are allocated for management training—e.g., leadership and project management

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Allocating IT Training Resources

Case Study 6

An integrated investment management process is used to select and manage training projects.

Practices Illustrated

- Ensure that an investment process is in place
- Consider the benefits and costs associated with various training design and delivery methods

Background

During the mid-1990s, because funding for training at this large technology company was curtailed, the company reassessed its training processes. Funding and investment decisions for training were done by various business groups on an ad hoc basis. Little thought was given to how new training initiatives impacted the company's strategic goals. Further, few processes were in place to ensure that the selection and implementation of the most strategic training projects were being managed properly.

Challenge

To institute an integrated training investment management process that involves both the business unit and corporate levels.

Solution

Executive stakeholders from the major business groups reallocated 10% of their training budgets to a companywide strategic training portfolio.

Key organizational decisionmakers became involved in the investment management process.

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Allocating IT Training Resources

Case Study 6

Solution (cont'd)

The company instituted an investment management process (see next slide) for all major training development projects that

- clearly defines responsibilities and authority for each stakeholder;
- includes a ranking process using weighted criteria to compare and rank projects as part of investment reviews (these criteria include anticipated demand for the investment from internal sources; potential for increased revenue; risk of unfavorable consequences if investment is not made; availability of resources to support the project; and business value or strategic fit); and
- requires that all training projects are monitored from initial design through implementation.

Reported Results

Investment decisionmaking at the corporate level (through an Executive Review Board and Integrated Portfolio Management Teams) is based on how training investments support corporate business goals and results.

Project development teams can better manage risks and resources associated with each training initiative.

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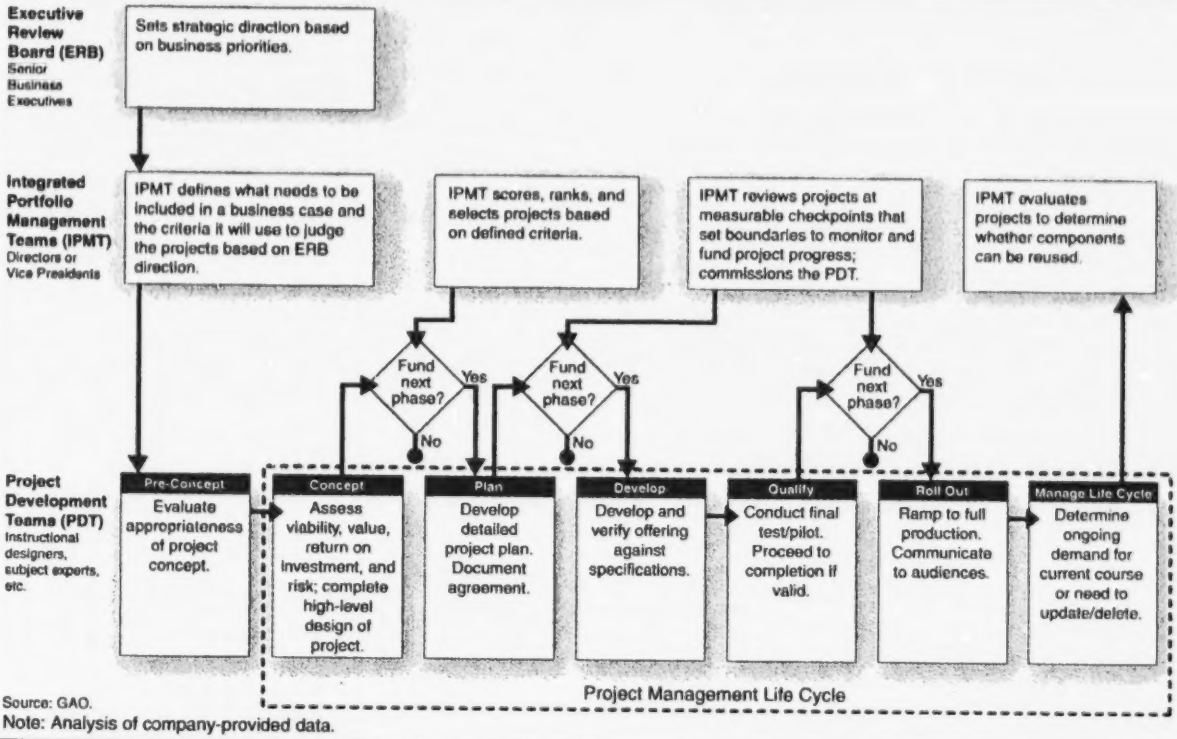
Allocating IT Training Resources

Case Study 6


Executive Review Board (ERB)
Senior Business Executives
Sets strategic direction based on business priorities.
Integrated Portfolio Management Teams (IPMT)
Directors or Vice Presidents
IPMT defines what needs to be included in a business case and the criteria it will use to judge the projects based on ERB direction.
IPMT scores, ranks, and selects projects based on defined criteria.
IPMT reviews projects at measurable checkpoints that set boundaries to monitor and fund project progress; commissions the PDT.
IPMT evaluates projects to determine whether components can be reused.
Fund next phase?
Yes
No
Fund next phase?
Yes
No
Fund next phase?
Yes
No
Project Development Teams (PDT)
Instructional designers, subject experts, etc.
Pre-Concept
Evaluate appropriateness of project concept.
Concept
Assess viability, value, return on investment, and risk; complete high-level design of project.
Plan
Develop detailed project plan. Document agreement.
Develop
Develop and verify offering against specifications.
Qualify
Conduct final test/pilot. Proceed to completion if valid.
Roll Out
Ramp to full production. Communicate to audiences.
Manage Life Cycle
Determine ongoing demand for current course or need to update/delete.
Project Management Life Cycle

Source: GAO.
Note: Analysis of company-provided data.

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Allocating IT Training Resources

Case Study 7

A training program was established to target carefully screened applicants.

Practice Illustrated

- Provide specialized training for people with high potential

Background

This major finance company is highly dependent on technology in conducting its business, which includes selling software products to financial institutions and developing unique systems. It has historically found it difficult to hire enough qualified technical employees, especially during the tight job market of the 1990s, and it needed a method of addressing skills shortages.

Challenge

To institute a program that identifies promising nontechnical candidates and rapidly trains them to become proficient in technical areas.

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Allocating IT Training Resources

Case Study 7

Solution

To fill staff shortages or anticipated staff shortages in technology positions, the company established the Business Technologist Program. This intensive 3-year training program is divided into individual programs that focus on particular target audiences or job positions. For example, one program focuses on carefully selected nontechnical new hires with prior business experience.

A large component of the program cost is the salaries. Participants are paid during 18 weeks of training before they are placed in productive jobs. Training facility costs—such as workstations and networks—can also be high. The company selects applicants very carefully before investing in their training and development, and protects its investment by careful monitoring.

During the classroom training, recruits are monitored by frequent testing and helped if they seem to be falling behind. After being placed in jobs, they are assigned mentors, and performance is evaluated at half-year intervals instead of annually as with other staff.

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Allocating IT Training Resources

Case Study 7

Solution (cont'd)

The company keeps costs down by paying recruits approximately 50 percent of the market rate for a seasoned IT professional during their training period. This is usually a pay reduction for people entering the program. Salaries can be increased after each semi-annual performance review and rise to market levels during the 3 years of the program.

Reported Results

The company stated that the program is effective because of the number and quality of its graduates—more than 500 people over the course of the program. It has been able to quickly train staff to fill technical positions, and retention of program participants has been better than average. An additional benefit has been increased diversity in the workforce.

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Allocating IT Training Resources

Case Study 8

Company targets resources to develop a cadre of skilled project managers.

Practices Illustrated

- Identify people who have high potential and provide them with specialized training
- Ensure that resources are allocated for management training—e.g., leadership and project management

Background

This large financial services company had a number of "painful costly project experiences caused by a lack of project management knowledge and experience." Project managers from IT and from the various lines of business tended to focus more on their respective needs rather than the overall needs of the organization. The company lacked an internal network of skilled, qualified project managers.

Challenge

To develop a cadre/network of information technology managers (and business managers) with the proper project management skills, internal professional contacts, and management background to deliver projects within cost and on schedule.

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Allocating IT Training Resources

Case Study 8

Solution

The company's IT training group designed a comprehensive project management development program (PMDP) for IT managers and others in leadership roles. The program includes two separate 4-month training programs: PMDP Level 1 for new project managers and PMDP Level 2 for experienced project managers. The company took the following steps to support the success of training:

- obtained a senior executive sponsor;
- assembled an internal consulting team possessing a broad view of the company's projects, and having management and training experience;
- identified the causes for project failures within the company and used the information to help develop the program;
- created the program around six broad categories of required skills (project planning, project control and management, managing the team, managing the environment, risk management, and the company's project life cycle);

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Allocating IT Training Resources

Case Study 8

Solution (cont'd)

- identified top performers and ensured an optimal mix of participants that broadly represented the company (business and IT managers);
- created a program that allowed trainees to network and be mentored; and
- developed evaluation tools to assess the PMDP.

Reported Result

The program reduced the number of project difficulties caused by inadequate project management knowledge and skills.

It expanded the internal network of skilled, qualified IT and business project managers who provide a ready source of expertise.

It also facilitated the exchange of approaches and practices that help ensure successful project management.

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Designing and Delivering IT Training

Once training needs are identified and resources allocated, it is important that the training design and delivery process ensures that learning occurs during the training and also ensures that the employee applies the training on the job.

The majority of the companies we studied said that they are still using traditional instructor-led training. However, they are taking advantage of more flexible design and delivery methods made possible by technology to deliver training to the user's desktop and to make training more convenient.

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Designing and Delivering Training

Practices

- Provide IT trainees with the flexibility to choose among different IT training delivery methods
- Ensure that on-the-job training is planned and monitored as part of the training process
- Consider combining different teaching methods (e.g., Web-based and instructor-led) within the same course
- Provide just-in-time training
- Consider outsourcing training solutions—e.g., university partnerships and external IT training and content providers
- Build courses using reusable components

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Designing and Delivering Training

Case Study 9

An e-learning solution offers flexibility in learning to a worldwide workforce.

Practices Illustrated

- Provide flexibility to choose among different delivery methods
- Consider combining different teaching methods
- Provide just-in-time training
- Build courses using reusable components

Background

This technology company believes that e-learning is a revolutionary way to empower a workforce with the skills and knowledge it needs. The company implemented e-learning solutions internally so it can gain advantages and also act as an e-learning model for its customers.

Challenge

To create an environment where learning resources and information are clearly integrated into everyday job functions and readily accessible to employees worldwide.

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Designing and Delivering Training

Case Study 9

Solution

To implement e-learning solutions, the company took the following steps:

- Established e-learning portals on the company's network that are integrated with its e-business strategy. (These portals are illustrated on the following page.)
- Implemented a central e-learning system (see graphic on next slide), accessible from the portals, that provides employees with Web-based learning solutions, including video-on-demand (VOD)—which captures expert instructors on video—computer-based training, an electronic library, virtual labs, and net meetings. These delivery methods may be combined in a single training course.
- Invested in infrastructure that supports the company's content delivery (VOD requires high bandwidth).
- Invested in a state-of-the-art video studio for its VOD learning solutions.
- Established a reusable object strategy that enables the training workforce to create and deliver modular, reusable learning "chunks" for different learning experiences.

Reported Results

The company increased employee productivity and communications and decreased costs.

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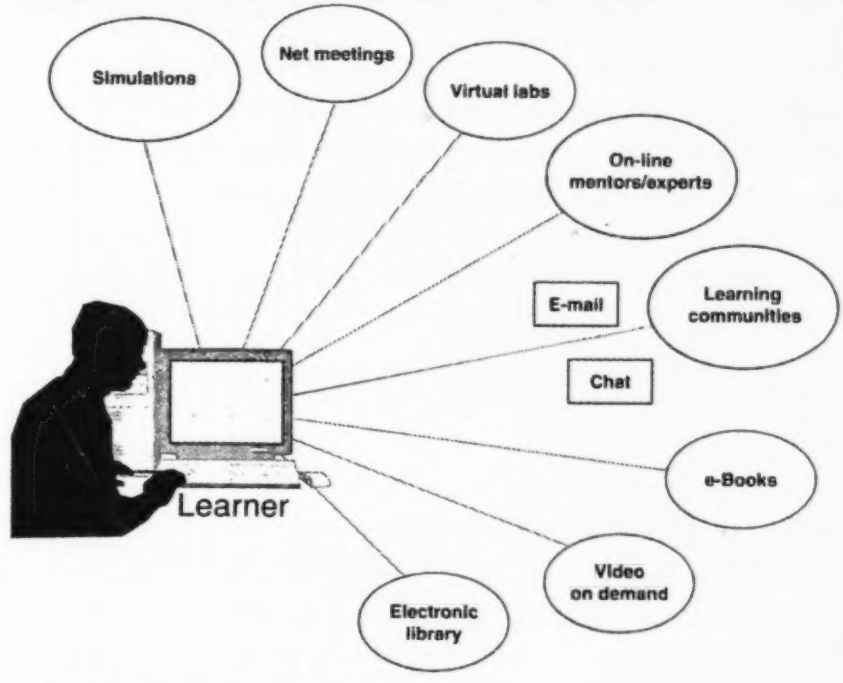
Designing and Delivering Training

Case Study 9



Source: Company-provided graphic, used with permission.

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Designing and Delivering Training

Case Study 10

Reusable learning component strategy offers flexible approach to improve course design/delivery productivity and cost savings.

Practices Illustrated
- Provide just-in-time training
- Build courses using reusable components

Background

Career certification courses at this technology company were previously delivered almost exclusively in an instructor-led format. In 2000, to fulfill its goal of becoming a leader in e-learning, the company devised a strategy to develop reusable components for its course offerings. These components would allow courses to be packaged and delivered in various ways, including traditional classroom training, live virtual training, or self-paced e-learning.

Challenge

To move the company's training courses from large inflexible courses to searchable database-driven objects—reusable chunks of information—that could be reused and modified independent of their delivery method.

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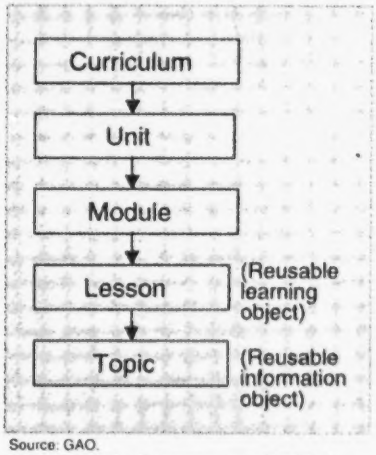
Designing and Delivering Training

Case Study 10

Solution

A strategy was developed that included the following tasks:

- Define standards and guidelines for designing and developing reusable learning components.
- Establish a hierarchical curriculum structure, as at right.
- Create *reusable learning objects* ("lessons") by combining individual reusable information objects.
- Create *reusable information objects* ("topics" or "pages") by combining content items, practice items, and assessment items.



Source: GAO.
Note: Analysis of company-provided data.

The implementation strategy began with a limited number of certification courses to give developers time to embrace the new approach. The company now has 20,000 reusable learning objects that can be reused for course development.

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Designing and Delivering Training

Case Study 10

Reported Results

Course development time was significantly reduced—i.e., selected courses were developed in half the time/budget because learning objects were reused.

The company achieved a positive return on its investment.

The approach enabled all field staff to access on-demand, personalized training, in the media of their choice.

Users have the ability to offer an assessment of the objects people need to achieve the desired performance.

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Evaluating/Demonstrating the Value of IT Training

Companies can determine whether training has achieved its intended business impact by integrating training measurements into their strategy and operations. Increasingly, stakeholders who fund training are interested in how training investments contribute to the company's business results.

Companies we visited recognize the importance of effectively evaluating the impact of training on business goals. All the companies are going beyond simply obtaining participant reactions. For example, some use tests or certifications to validate that the content was understood; others are deploying evaluation processes that measure business results.

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Evaluating/Demonstrating Value

Practices

- Collect information on how job performance is affected by training
- Validate IT content learning by testing and certification of specific skills—e.g., Java or C++
- Assess evaluation results in terms of business impact

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Evaluating/Demonstrating Value

Case Study 11

An automated evaluation process measures and reports training results.

Practices Illustrated
- Collect information on how job performance is affected
- Validate content learning by testing and certification

Background

This large financial services firm needed to improve the communication between its IT training organization, called Learning Systems, and its IT organization.

Challenge

To demonstrate the value of the training process to IT organization managers and facilitate their involvement in the training process.

Solutions

An automated evaluation process has been implemented to demonstrate the value of training through participant evaluations, automated surveys of how well training is applied on the job, and to some extent, Web-based testing and certifications.

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Evaluating/Demonstrating Value

Case Study 11

Solutions (cont'd)

Specifically, the automated evaluation process is used for the following:

- Obtaining participant reaction:
  - The Learning Systems computer system automatically generates an evaluation form that participants must complete before leaving class.
  - The data are compiled and analyzed by a proprietary database analysis tool and used to determine changes in instructors, course design, and other training factors.
- Assessing content learning:
  - Some courses use Web-based testing to demonstrate proficiency.
  - Many related career certifications also require testing to demonstrate proficiency.
- Determining how training is applied on the job:
  - Each month, the training organization selects courses for further assessment.
  - Participants receive an electronic survey about 1 month after course completion, in which they indicate how they applied the training on the job. The participant's manager receives a similar survey about the participant.
  - The information is then used to refine training activities.

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Evaluating/Demonstrating Value

Case Study 11

Solutions (cont'd)

The Learning Systems director meets with IT organization business managers each month to discuss how learning strategies can best help the IT organization achieve its business objectives. These discussions include budget, hours of training delivered, reactions to training, and types of delivery methods.

Reported Results

Participant evaluations, testing, and post-training feedback help assess the value of training.

Collecting evaluation data after the employee has returned to the work environment helps determine if training was applied on the job.

The monthly discussions help improve communication between the IT organization and Learning Systems.

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Evaluating/Demonstrating Value

Case Study 12

Certifications are used to measure learned skills.

Practice Illustrated

- Validate content learning by testing and certification

Background

This telecom company created a new group to be responsible for the corporate Web site and for sites used by customers to communicate with the company. The vice president in charge worked with the chief technologist to develop a list of skills, matching needed skills to job categories. Once the group was up and running, the skills list was refined by consultations with managers and staff.

Challenge

To measure progress in developing the skills needed to provide new and improved Web services to clients.

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Evaluating/Demonstrating Value

Case Study 12

Solution

The company contracted for Web-based certification testing on the required skills, such as Java programming. Employees were required to pass all the certifications needed for their jobs, but were allowed to fail and retake the certification tests as many times as needed without penalties. Incentives and rewards, such as public recognition or lunch with the senior vice president, were offered to motivate staff. Training relevant to the certifications was provided by about 400 on-line courses, as well as through books recommended by the certification vendor and by informal, on-the-job training.

The senior vice president in charge of the group tracked the group's progress on certifications against performance metrics, including time to complete projects and number of pages of program code rejected by quality control. Improvements in the code reject rate were seen after employees passed certification tests.

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Evaluating/Demonstrating Value

Case Study 12

Reported Results

By linking training and certification, the company could directly measure employee content learning and also validate training courses.

By monitoring individuals' performance using the metric of pages of code rejected, the company was able to demonstrate improved job performance correlated with employees' becoming certified.

The certification process and how it was administered led to increased employee motivation to take training and improved morale, since employees valued the certifications.

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Issues Critical to Effective IT Training

The case studies illustrate that practices identified and performed by leading private sector companies can result in more effective training management. However, based on company and expert input, we noted several crosscutting issues that should be considered in implementing effective IT training practices. These issues include

- **Responding to the rapid pace of technological and social change**. Rapid changes in technology (e.g., the growth of e-learning) affect how training is delivered as well as what competencies are needed (e.g., the growing need for information security skills). Changes in the IT workforce, such as increased diversity, may require a different mix of skills.
- **Demonstrating return on investment in IT training**. Although there is pressure to show return on investment (ROI) from training, it is difficult and costly to demonstrate ROI. Only two companies reported that they were actually calculating ROI on IT training.
- **Managing funding constraints during an economic downturn**. The economic climate and its impact on training expenditures may affect the overall level of training delivered by organizations or the mix of delivery methods—such as outsourcing or e-learning.

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Issues Critical to Effective IT Training

- **Obtaining visibility for training at the highest levels of the organization.** Several of our companies have existing or emerging processes that include executive management involvement. This can enhance an organization's ability to incorporate training in its planning, and can improve a training organization's ability to undertake new initiatives.

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A Final Note

GAO's review of private sector practices indicates that training is not simply a support function, but a strategic element in achieving corporate objectives. Traditional training activities are being reinvented to focus on implementing a comprehensive learning strategy and demonstrating business impact. Companies are adopting new ideas about training, but many initiatives are in their early stages, and private sector officials expressed interest in learning about innovative practices emerging from the public sector.

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